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Green FROM THE GROUND Up

SPECIAL REPORT

TOP GREEN-IT ORGANIZATIONS

These green-IT leaders have already taken the **simple steps.** Now they're looking at **complex technologies** such as water-cooled mainframes and geothermal energy.

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THIS ISSUE | 10.25.2010 [VOL. 44, NO. 20 $5/COPY]

TOP GREEN-IT ORGANIZATIONS

Green From the Ground Up

SPECIAL REPORT **17** Our third annual Top Green-IT Organizations issue showcases the achievements at 12 IT departments that are reducing power demands and using technology to create energy efficiencies. These innovative teams were chosen from a group of nearly 100 applicants for their commitment to saving energy through technology.

IT execs from No. 1 PwC cut a green ribbon to open a new energy-efficient data center.

WINNER PROFILES | 18 The top spot goes to PricewaterhouseCoopers, which this year brought a LEED Gold-certified data center online, achieved a goal of reducing its carbon footprint by 20%, and decreased travel by 30%. Read all 12 profiles.

OPINION | 30 IT resources expert Jonathan Koomey says technology is a key tool for dealing with the climate challenge.

MORE ONLINE: Visit our Web site to check out the top 12 Green-IT Vendors, and to take our Green-IT Quiz. **computerworld.com/topgreen10**

HEADS UP | 2 A new U.K. bank completely **outsources IT.** | **Zeus hackers** may be looking for business data. | **4** Corporate anthropology could bring **Enterprise 2.0** success. | A strong quarter for Infosys may signal an **offshoring upsurge.**

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HeadsUp

Employees serve customers at Metro Bank's first U.K. branch, in central London. Britain's first new retail bank in more than 100 years. Metro Bank has a completely outsourced IT infrastructure.

REUTERS/TOBY MELVILLE

FINANCIAL SERVICES

New U.K. Bank Outsources All Tech

METRO BANK PLC, the first retail banking company launched in the U.K. in over a century, opened this summer with a 100% outsourced IT infrastructure.

CEO Craig Donaldson said that having an efficient IT system was "crucial" to the bank's launch. Metro Bank is attempting to provide superior customer service, with offerings such as long hours of operation seven days a week and the ability to give customers credit or debit cards instantly at branches.

The bank has four branches and plans to open 40 more in the next four years, eventually reaching a total of 200 by 2020. But it only has five in-house IT staffers because of the outsourcing arrangement.

Metro Bank outsourced its IT systems and maintenance to London-based services provider Niu Solutions. The bank has a "pay as you grow" contract under which it will pay more but receive more services as it expands.

Financial details weren't disclosed, but the deal covers infrastructure and software management, voice and data services, virtual desktops and mobile technology, as well as the bank's Web site, help desk and two data centers.

Metro Bank principally uses the popular Temenos banking software, plus a mix of Oracle, SAP and IBM applications.

The newcomer offers online banking, and it aims to add mobile phone banking next year. Future plans call for systems that branch employees can use to create personalized credit cards for customers on-site, and RFID tags for mobile phones that would allow the devices to be used for contactless payment.

– Leo King, Computerworld U.K.

SECURITY MONITOR

Zeus Hackers May Harvest Business Info

Criminals who use the Zeus malware may be working on a new angle: corporate espionage.

Zeus typically steals online banking credentials. But Gary Warner, a computer security researcher at the University of Alabama, said that the criminal groups that use Zeus have started trying to find out where their victims are employed.

Sometimes the malware will pop up a fake online bank log-in screen that asks the victim for the name of his employer. Warner said that in online forums, hackers recently speculated that they might be able to sell access to computers associated with certain companies or government agencies.

"They want to know where you work," he said. "Your computer may be worth exploring more deeply because it may provide a gateway to the organization."

Zeus could be a powerful tool for stealing corporate secrets, because it lets the criminals remotely control victims' computers, scan files and capture passwords and keystrokes. With Zeus, hackers could tunnel through the victim's computer to break into corporate systems.

Warner said the biggest threat is that Zeus could infect employees' home PCs and laptops that are outside the corporate firewall but have access to company data.

– ROBERT McMILLAN, IDG NEWS SERVICE

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Building the engines of a Smarter Planet:

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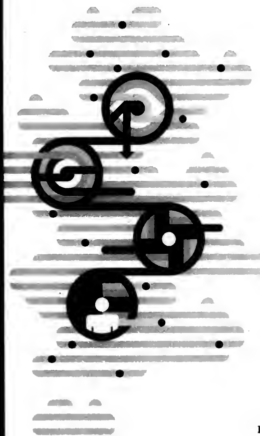

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BETWEEN THE LINES

By John Klossner

THINK TANK

Wanted: Corporate Anthropologists

YOU KNOW THE STORY: The CEO orders up an internal "Facebook for the enterprise" to boost employee collaboration, but six months after deployment, it's a ghost town.

Getting users to adopt so-called Enterprise 2.0 technologies and reaping real business benefits from those implementations requires a different approach, according to The Corporate Executive Board, a research and advisory services company. CEB researchers recommend the following steps:

- First, identify the high-value business outcomes you want achieve, such as speeding up new-product development, before picking collaboration technologies.
- Identify the "collaboration hot spots." Interview employees to understand their communication habits and workflows.
- Select technologies that will improve or accelerate existing workflows. CEB researchers say that companies can achieve user adoption rates of 60% or more for technologies that accelerate workflow, such as mobility tools, unified communications and enterprise search. But user adoption falls below 40% for technologies that require workers to add something new to their workflows, like use a wiki or social network.

Mark Tonsetic, a manager in CEB's IT practice, said that boosting collaboration requires the skills of a corporate anthropologist who can observe office communication and suggest improvements.

"You can't hire 100 Margaret Meads," Tonsetic said, but you can find people inside and outside the organization who have skills in fields such as organizational design, user experience, knowledge management, information science, social media and storyboarding.

This is good news for IT pros who have or can acquire these skills, said Shvetank Shah, executive director of CEB's IT practice. "These are new jobs in IT with high demand and high sticker prices," he said. "These are six-figure jobs."

– Mitch Betts

Micro Burst

An updated inventory of U.S. government agencies uncovered

2,094

data centers, 994 more than previously estimated.

OUTSOURCING

Infosys Results Signal Rebound In Offshoring

Outsourcing vendor Infosys Technologies Ltd. posted strong financial results for the quarter that ended Sept. 30, as customers started placing orders that they had postponed during the recession.

India's second-largest outsourcer reported that revenue was up 30% and profits grew 18% over the same quarter last year. Tata Consultancy Services Ltd. and Wipro Ltd. are expected to report similar results.

In anticipation of new business, the Indian outsourcers are hiring employees at levels comparable to those in place before the recession, said Amitabh Das, CEO of Vati Consulting, a recruitment firm in Bangalore.

However, analysts warned that Indian outsourcers could see their margins shrink as a result of competition from multinational services companies that have offshore operations. Indian firms also face higher costs as they set up larger operations in the U.S. to counter a growing anti-offshoring sentiment in the U.S., said Jimit Arora, research director at Everest Group.

Meanwhile, customers are reducing the number of outsourcing firms they use and are asking for deeper discounts from those that they retain, Arora said.

– JOHN RIBEIRO, IDG NEWS SERVICE

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NEWS ANALYSIS

IT Seeks a Safe Road to the Cloud

CIOs describe starter cloud efforts that are designed to minimize security and legal risks. By Patrick Thibodeau

THE ROAD MAP for expanding enterprise use of cloud computing is being drawn by IT executives like Mark Stone, CIO at Safety-Kleen Systems Inc.

Safety-Kleen, an environmental services company with about 4,200 employees, has turned to cloud technology to run 15% of its applications, mostly for functions like CRM and travel management, Stone said. About 35% of the company's application portfolio, including its general ledger systems, could be hosted externally within three years, he added.

"I can go to a variety of [software-as-a-service] providers and put in software that's every bit as functionally rich as anything I've developed on-site," without having to worry about the upkeep of an IT infrastructure, Stone said at *Computerworld's* Storage Networking World conference earlier this month in Grapevine, Texas.

Cloud-based services are proving to be increasingly viable options, according to several IT executives. Research firm IDC pegs the cloud market at $23 billion today and projects it will grow to about $55 billion in 2014.

But obstacles remain. Experts note that many IT executives are still concerned about cloud-related security and legal issues. A number of CIOs said their companies are launching small cloud projects designed minimize those potential problems.

For example, security concerns are stopping RAE Systems Inc. from moving core ERP software to hosted setups, but the maker of multisensor chemical and radiation detectors is using Informatica Corp.'s cloud-based data-integration service to combine an Oracle ERP system with Salesforce.com CRM software.

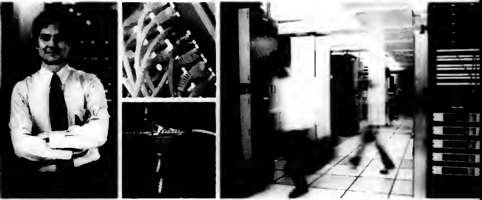
CIO Lien Chen said the alternatives to hosted integration — packaged Oracle integration software or on-premises appliances, plus consulting services for each — would have cost much more.

Robert Scott, managing partner at Scott & Scott LLP, a law firm that advises clients on IT contractual issues, says he routinely sees conflicting forces at work among users considering a move to the cloud. "There is this great pull toward cloud and SaaS offerings," he said, but added that there's also "a lot of anxiety."

Managing risk isn't a new discipline for Tom Honan, senior vice president and CIO at CapitalSource Bank, where the cloud is seen as a viable alternative to in-house systems.

Honan said that about 15% of the bank's application portfolio is now in the cloud, and he continually explores the viability of cloud-based platform and infrastructure services. ◆

[illegible] of [software-as-a-service] providers and put in software that's **every bit as functionally rich** as anything I've developed on-site."



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XP Deadline Haunts IT

Many companies must deal with the looming XP and Office migration crisis before fully turning to other key tasks cited in Gartner's annual top-10 IT issues list. By Patrick Thibodeau

AT THE SAME TIME IT executives must start evaluating new technologies to keep data center infrastructure and operations up to date, the hard deadline for migrating thousands of users from Windows XP and Office 2003 is approaching fast.

While desktop operating system migration ranked No. 7 on Gartner Inc.'s latest list of the top 10 issues facing corporate CIOs, Gartner analyst David Cappuccio indicated that for many companies, it has become the most critical short-term need.

Microsoft has said it will stop supporting Window XP and Office 2003 in April 2014.

"You may find yourself in a situation where these migrations become the dominant projects in your organizations over the next few months," Cappuccio said.

Matt Holmes, systems manager for Johnson County Community College in Overland Park, Kan., said Windows migration is "definitely" an issue.

"Over the summer, we just had a round of 'firefighting,' where we had a bunch of Windows XP SP2 machines that had to get upgraded to Service Pack 3 because of end-of-life support," said Holmes. "I think it kind of snuck up on the desktop support folks."

The college is now planning to migrate its users to Windows 7, he added.

Gartner noted that while IT executives must deal with the Windows and Office deadlines, they also need to decide how to address the myriad longer-term issues that will transform data center operations. ◆

> I think **it kind of snuck up** on the desktop support folks.
> **MATT HOLMES,** SYSTEMS MANAGER, JOHNSON COUNTY COMMUNITY COLLEGE

Gartner's Top IT Trends

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Dealing with data

Energy and green IT

Unified communications and collaboration

Thinking horizontally

Open source collaboration

Windows XP migration

Computing and data center density.

Cloud computing

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THE Grill

Robin Beck

This IT exec keeps pace with the technology demands of a dynamic Ivy League campus.

What do you do in your spare time? I like people, so I like spending time with friends and family, entertaining. I love to travel. I like to garden and cook and share my cooking. And I love conservation, sharing good wine and good food.

Most interesting places you've traveled to: Russia in the '80s, when it was still the Soviet state, and Thailand a couple of years ago.

If you went back to college now, what would you study? Exactly what I did before: English and humanities. The ability to take complex ideas and make them understandable to a wide audience is a skill I learned as an undergraduate, as well as to express ideas in writing and to think creatively.

PHOTOGRAPHY BY CANDACE DiCARLO

AS VICE PRESIDENT *for information systems and computing at the University of Pennsylvania, Robin Beck oversees an extensive IT operation that must serve the computing needs of thousands of people in varying roles, from faculty and researchers to administrative staff and students. To do this, Beck relies on more than 300 employees who, she says, are as diverse as the individuals her department serves. Previously, she spent 18 years at General Electric Co., where she gained extensive experience in project management, business process design, organizational design and technological innovation. That background, along with her experience at Penn, has given her insight into today's IT environment.*

What's the most unique aspect of running the IT department at a university? First, it's the wonderful energy that students bring. They are certainly users of technology, and

Continued on page 12

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> **The things that appeal to younger workers are the same kinds of things that keep boomers content in their work environment.**

Continued from page 10

their expectations continue to evolve. So you can never feel like you're in a rut, because the environment's always being pushed. The second has to do with diversity. We consider ourselves a global university. It's a very dynamic kind of place, so we don't have one culture that says, "This is how you do it."

Your department's goal is to provide "anytime, anywhere" access to information. What's the biggest challenge for an always-on IT shop? It's selecting the tools that help us to do that. It's the redundancy you have to build in, because after all, this is about technology, and failures can occur. And it's balancing those things with the cost of providing that always-on, anytime, anywhere. And [then] there's our mobile society. It all makes for interesting challenges for people who have to provide that infrastructure.

According to the Privacy Rights Clearinghouse, 72 breaches at universities and colleges across 30 states were reported in the past 12 months. Is IT security at a university any more challenging than it is at a business? I don't think there's any difference, in that our job is to protect information, protect access to that information. But openness and availability is absolutely emphasized in universities. And all the principles of openness and collaboration that universities operate under can be different than in some businesses. The other thing is that we have in some respects a very mobile population [of students] coming into a campus environment every year. At Penn, it's 2,500 new students, and they bring in all sorts of equipment that will be attached to the network.

So, how do you tackle these security challenges? You begin with training and awareness, and peer-to-peer training and support. We all like to learn from our peers. And we put the support right where people are getting their first interaction with the university.

Can you give an example? We have ITAs, information technology advisers, kind of like RAs [resident advisers in dorms]. These are students. We interact with them to first and foremost make sure they understand how important security and privacy of information is and that they themselves are helping incoming students. And they do this throughout the year. If you're having trouble retrieving your paper at 2 a.m., it's the ITA, someone on your floor, who is there to help you.

You serve a variety of "clients" as a university IT shop – faculty, administrative staff and students. How do you learn about and then address their varying needs? It comes down to formal and informal mechanisms. I believe an important part of anyone's job is listening, so if we put a project team together, for example, there will always be a wide variety of advisory groups representing different environments across the university. So if you're doing something for the division of finance, a new system of some kind, you'll not just be working with finance, but with users of the system and potential influencers of the system. So you learn to listen to different perspectives and the different ways people express their needs and suggestions.

As an IT leader who has more access than most to the younger generation, what do you think IT departments will have to do to capture these young people as employees? I don't think this is generational. I think if you're attracted to IT, you like to be challenged. You like an inclusive management style. You like an environment where there's flexibility in how you approach things. I have difficulty believing that an IT organization that Gen X or Gen Y is interested in is any different from one that is attractive to a boomer. I believe that the things that appeal to younger workers are the same kinds of things that keep boomers content in their work environment, if we're talking about IT. People want to work in an energetic, committed environment. They want to be challenged, they want flexibility, they want to be listened to.

You said in a past interview that leadership is "50% or more about listening." What's the other 50%? It's making sure that people understand their contributions are valued and that they're valued as individuals. The more you do that and listen to people, the more that encourages their creativity, their innovation, and it encourages them working with other people because they know it's based on respect and trust. To bring out the best in people, you have to recognize what they have achieved and what they're capable of achieving.

— Interview by Computerworld *contributing writer* **Mary K. Pratt** *(marykpratt@verizon.net)*

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OPINION

PRESTON GRALLA

Should Microsoft Be Carved Up?

Spinning off Microsoft's consumer division certainly sounds good for stockholders, but what about the business itself – and users?

A RECENT GOLDMAN SACHS REPORT that downgraded Microsoft stock from Buy to Neutral also made this startling suggestion: Microsoft should be carved up, with its consumer division severed from its enterprise business.

Goldman Sachs reasoned that the consumer division has value that could be unlocked if the unit was spun off. The combined stock valuation of a new consumer company plus the enterprise-focused Microsoft would exceed the valuation of Microsoft in its present form, said Goldman Sachs. (This differs from the plan to split the company in two that was raised in the antitrust suit in 2000: It called for one division focused on operating systems and another focused on applications.)

The way Goldman Sachs figures it, when you value Microsoft's various divisions individually, the combined figure is $259 billion, about $52 billion more than Microsoft's current worth.

It certainly sounds like a good deal for stockholders — who wants to turn down a $52 billion profit? But would it be good for Microsoft in the long term? Or for users of Microsoft products? The answer on both counts is no.

Wall Street focuses on short-term profits rather than the long-range financial health of a company. That's to be expected. Stockholders only have a stake in a company when they're holding stock, not after they sell it. If the company heads south after they sell their stakes, so be it.

But employees of a business, and the people and companies that use that business's products and services, have a very big stake in the long-range health of a business, no matter the current stock price. Stock prices will always fluctuate; running a business based on short-term profits is dangerous.

So, what would splitting up Microsoft mean? It would make it far more difficult for the company to innovate, and far less likely that customers would get the best products and services possible.

The key reason is that the line between consumer and enterprise products is thin and getting thinner all the time. Smartphones, for example, started out as enterprise tools, morphed as consumer tech, then re-entered the enterprise in new forms. Other technologies developed for consumers may one day find a home in the enterprise.

In addition, research can be shared between consumer and enterprise divisions. Even when there's no clear, direct link between consumer and enterprise products, Microsoft can take what it learns from one product line and apply it to another. Take the cloud, for example. There's no doubt that cloud computing is important to Microsoft's future. The better Microsoft understands the cloud, the better its products will be, and as a result, the better off enterprises will be.

Where does Microsoft have long and deep experience in cloud computing? In its Xbox Live online gaming service, which the Goldman Sachs report described as "one of the largest paid cloud communities in existence." By learning how to manage a high volume of cloud-based transactions there, Microsoft has built up very important expertise in cloud-based computing. It can take that knowledge and apply it to enterprise computing as well. If the company were split, it wouldn't be able to do that. The company, and those who use its products, would be far worse off.

The upshot? If Microsoft were chasing easy, short-term profits, it would make sense to spin off its consumer division and get a hefty sum in return. But if it's looking for long-term health, it makes sense to keep the company whole. And all indications show that's exactly what it will do. ◆

Preston Gralla is a contributing editor for *Computerworld.com* and the author of more than 35 books, including *How the Internet Works* (Que, 2006).

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[1,2]For details on claim substantiations, visit hp.com/servers/unleash5

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Green FROM THE GROUND Up

SPECIAL REPORT

These **12 organizations** have already harvested savings from many **simple green efforts**. They're now looking for rewards from **more complex technologies** such as water-cooled mainframes and geothermal energy.

MICHAEL AUSTIN

[illegible]
computerworld.com/topgreenit

How we picked the winners. **Page 29**

How technology can be an **energy game-changer. Page 30**

GREEN IT
ORGANIZATIONS

Computerworld's top 12 green-IT organizations where chosen from nearly 100 applicants, each striving to find new ways to reduce energy consumption in their IT equipment and use technology to conserve energy. That's not easy. Several of the organizations named to this year's list have led the green-IT movement for years. They're stretching toward more challenging projects, like the large-scale data center migration at Northrop Grumman (page 27) or the effort at Citigroup (page 20) to relocate network switches to cut copper use and power consumption by as much as 50%.

And even with individual achievements like these, moving green IT forward is a collective effort. George Washington University (page 24), for example, is putting out the challenge to other universities to launch green-IT initiatives.

As knowledge is shared, others will join with these elite 12. Read their stories to find ways your organization can conserve energy — and save money. And check out our online package to read *Network World's* picks for the coolest green-IT products.

» PwC U.S. CIO Stuart Fulton, Deputy CIO and CTO Rick Ancona, and Senior Managing Director of Finance/Operations Joe Killian cut a green ribbon to officially open the firm's new Tier 3 data center.

1 PwC

PricewaterhouseCoopers

Wow-factor projects mixed with smart changes to everyday tasks make this Big Four accounting firm a leader in green-IT initiatives.

WHERE DO YOU START when your company demands a 20% reduction in its carbon footprint? At PricewaterhouseCoopers, it wasn't enough to just pursue high-profile projects, such as building the LEED Gold-certified data center that came online in January.

It was just as important to come up with grass-roots ideas and make smaller companywide changes, such as rolling out multifunction printers configured with two-sided printing as the default, using longer-lasting print cartridges, promoting videoconferences over in-person meetings and providing a carbon calculator that employees can use to see how their offices stack up against those of their peers — a tool that helped reduce office energy use by 18%.

"We've hit a lot of the low-hanging fruit," says John Regan, director of data center services. "Now it's about those incremental changes." Those changes, big

» **PwC employees and guests gather in front of the firm's new Tier 3 data center in Georgia following a ribbon-cutting ceremony last March. The facility has earned a LEED Gold certification from the U.S. Green Building Council.**

and small, have added up: In September, PwC achieved its goal, just two years after making the pledge — and two years ahead of schedule.

PwC's new data center in Georgia has made a significant contribution, reducing power consumption by 20 million kilowatt-hours and cutting operating costs by $2 million — a 40% savings. The firm realized those savings by virtualizing 2,500 servers, using more-efficient equipment and moving to an optimized hot-aisle/cold-aisle design. PwC also distributes power at 575 volts AC instead of the industry standard 480 (which saved on copper and eliminated some uninterruptible power supply equipment).

KC Mares, president of data center design firm Megawatt Consulting, has installed 575-volt distribution systems, and he says the primary benefit is upfront savings. "It saves on capital costs, but operating cost savings are generally in the area of 1% of less," says Mares.

The new design allowed PwC to raise the temperature of chilled-water feeds into the air conditioning system by 10 degrees, which has translated into an immediate energy savings of 15%. In addition, air-side and water-side economizers drop the mechanical energy consumption of computer-room air conditioning systems by 75% when active, says Bill Panian, PwC's data center facilities manager. In February, the chillers ran just 6% of the time, helping the firm achieve a savings of 100,000 kwh — an unexpectedly good result.

A monitor in the lobby of the data center building features a live feed that shows energy consumption and the performance of the air-side economizer in real time. Panian says he expects technology advances to allow chilled-water temperatures to continue to rise over time, and that should bring even greater efficiencies.

PwC has also seen a 30% decrease in travel since April, after it pledged during its "Green Week" to plant five trees for every videoconference scheduled. By August, it had committed to planting 4,200 saplings.

The reduction in travel was partly due to the recession, which made videoconferencing an attractive alternative to purchasing airline tickets, admits Shannon Schuyler, PwC's corporate responsibility leader. Will people still opt for videoconferencing once the economy picks up? That will be the real test, she says.

"Our experience suggests that once companies discover videoconferencing, it tends to stick," says Chris Mines, an analyst at Forrester Research Inc. The technology works best for internal or joint team meetings, making it ideal for organizations with far-flung teams, like PwC's consulting business, he says.

And after an energy audit, office workers and management reduced office energy consumption. They also started using double-yield, 20,000-page toner cartridges, which halved the number of cartridges that needed to be recycled.

"It's like a snowball," Panian says. But it was those aggressive carbon-reduction targets that got the ball rolling. ◆

GREEN TEAMWORK

Many innovative ideas at PricewaterhouseCoopers are coming from "green teams," grassroots groups that have formed in 53 offices. "We've had a groundswell of people who want to be engaged," says Shannon Schuyler, PwC's corporate responsibility leader. Volunteers are turning off lights, shutting off laptops and monitors (a task that will soon be automated), and teaching others how to use videoconferencing. And they're constantly coming up with new ideas, which Schuyler collects in meetings every six weeks.

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2 Citigroup

This longtime green leader pushes the limits with a **data center floor design** to reduce copper and power use.

CITIGROUP is one of the granddaddies in the young world of green IT. In 2005, it launched its global data center strategy, with the goal of using only the most energy-efficient materials and technologies in its new data centers. Today, the financial giant is on track to reach its 2011 target to reduce absolute greenhouse gas emissions from 2005 levels by 10%, through a combination of energy-efficiency improvements, green building design, IT best practices and education. And in 2009, Citi saw its first-ever net reduction in data center power consumption — a drop of 2%.

Indeed, Citi's three-year-old enterprisewide Sustainable Technology program — which targets the five areas of power management, paper substitution, travel substitution, sustainable supply chains, and employee education and engagement — today offers many best-practice lessons on green-IT governance and implementation. Its e-waste recycling program processes more than 80,000 disposals annually and in 2009 generated more than $600,000 in remunerations from salvageable equipment.

"We've taken it from an initial program that no one had heard about to one of the major points continually referenced by our senior leadership, including our CEO," says Michelle Erickson, initiative director of sustainability and research.

Like many green veterans, however, Citi has been inspired to dig deeper for even more innovative approaches, Erickson says. For example, it was the first company to buy the new water-cooled IBM z196 mainframe this summer, before the first generally available systems were even shipped. And its global desktop standardization initiative is expected to reduce its global carbon footprint by 3%.

But even more impressive is its "One Megawatt Challenge," a new initiative that involves redesigning the data center floor by relocating network switches to the server cabinet, using Cisco's Nexus products. The anticipated result — expected by the second quarter of 2011 — is a significant reduction in the purchase and use of copper (from 72 long copper runs to just 12 fiber runs per cabinet) and a decrease of as much as 50% in power consumption.

"What stands out is the value of enterprisewide strategies and initiatives," says Mark Peters, a senior analyst at Enterprise Strategy Group Inc. "Across such huge organizations, just hoping for improvement is clearly not going to cut it." ◆

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GREEN TEAMWORK

Citigroup's Global Desktop Standardization Initiative was initially intended as an efficiency and cost-cutting measure. But when Joe Dietzmann, a director in the technology infrastructure group, took a look at the expected ROI, he pointed out that it didn't account for energy savings from the hardware refresh and the implementation of PC power management software, which together meant an additional $6 million in savings. "These teams were not accustomed to looking at things that way, so it was a welcome surprise," says Michelle Erickson, initiative director of sustainability and research. "Now they're huge supporters of what we're doing. When companies implement programs designed to reduce costs, chances are they will also have additional environmental benefits they didn't realize."

» **Green IT is "part of our DNA," says State Street Executive VP Madge Meyer.**

3 State Street Corp.

The investment giant **takes control of its PC power** for annual savings of over $1 million.

FOR STATE STREET CORP., environmental sustainability is embedded in pretty much anything the global investment services provider does. Its companywide Environment Management System operates on the principles of embracing green thinking in its corporate culture, technology choices and standard operating procedures, says Madge Meyer, executive vice president and head of global infrastructure services.

"This is part of our DNA," she says.

Case in point: About a year ago, when the marketing department needed additional computing resources, IT could have simply added processors to the existing mainframe. However, an upgrade to the system had just come on the market, and it used a lot less energy and offered twice the speed. "They made the quick decision not to upgrade the old system, as it wasn't classified as 'green,' " Meyer says. "It meant working every weekend and in their off-hours, but they made it happen."

On a global scale, the company's intensive virtualization effort over the past two years has resulted in annual energy savings of more than $3.5 million and a CO_2 emissions reduction of 30,000 metric tons annually. Its servers are 65% virtualized and will likely hit the 75% mark, Meyer says, since virtualization is part of a continuous-improvement effort.

In the networking arena, State Street completed a worldwide voice-over-IP rollout last year. And its 2009 PC power management initiative — which enables policy-based shutdown and wake-up of desktops for patches and upgrades — reduces greenhouse gas emissions by more than 6,000 metric tons. This is equivalent to taking 1,000 cars off the road, according to Meyer, and saves the company more than $1 million annually.

"State Street's 'green culture' drive is broader than just IT and data centers, per se. This is good, because life is so intricate that there are connections and green opportunities everywhere," says Mark Peters, a senior analyst at Enterprise Strategy Group Inc. "PC power management is one of those things that is talked about way more than it is implemented across corporations, so they deserve kudos for making it happen." ◆

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In meetings with technology vendors, Madge Meyer, executive vice president at State Street, has found that the vendors are eager to share information on their own environmental sustainability efforts. For instance, her team has been invited to tour IBM's green data centers. "Companies are beginning to really understand we're not just a financial services firm or a company focused on IT," Meyer says, "we're focused on sustainability as a long-term strategy."

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Because the organization is asking kids to reduce their own personal consumption, it's important to lead by example, says Peter Kendall, executive director of the Toronto-based organization. So in 2008, when Earth Rangers needed to increase its computing infrastructure to support its planned global expansion beyond Ontario, it knew it had to be energy-efficient.

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» The Earth Rangers IT team includes systems engineer Tracy Doucet and IT systems director Rob Di Stefano.

GREEN TEAMWORK Energy efficiency is intertwined with the way the entire organization operates, says Peter Kendall, Earth Rangers' executive director. Each department has a green team, which reports on its activities at a monthly management team meeting. "If the organization doesn't make energy efficiency a priority, it will never happen," Kendall says. "It has to be supported by everyone and driven by the top."

energy footprint, so that we're demonstrating our commitment to the kids we deal with," Kendall says.

The result: a highly virtualized data center, housed in a LEED Gold-certified building, that eliminates 90% of the hardware and nearly 85% of the energy costs that a conventional server deployment would require.

"Earth Rangers is interesting because it demonstrates starkly that 'big green advances' are not the sole remit of big organizations," says Mark Peters, a senior analyst at Enterprise Strategy Group Inc. "In 100 square feet, and with only 10% of a traditional hardware approach, its achievements and technologies are up there with the most advanced of the megacorporations."

Earth Rangers spent months researching the most power-efficient equipment from the most environmentally conscious companies, according to Rob Di Stefano, IT systems director. The implementation included a RAM-intensive blade server system from Dell that reduced the organization's previous eight physical servers to three physical M600 blade servers running 64 virtual servers.

In the future, Earth Rangers expects to benefit from a 40-well geothermal plant it is building to heat and cool the facility, as well as another solar array.

To reach its goal of cutting energy use 20% annually, it has invested in technology that tracks energy usage throughout the facility. "We can't meet our goal without that fine control," says Kendall. ◆

» Indiana Office of Technology employees have shown that green IT yields financial benefits.

5 State of Indiana

Remote support slashes desk-side visits at 80 state agencies, reaping six-figure savings.

WHEN MITCH DANIELS took office as governor of Indiana in 2005, he created the Office of Technology and charged it with creating more-efficient IT operations. That mandate meant improving IT services as well as creating a more environmentally friendly technology platform, says state CIO Brian Arrowood.

State IT leaders have made important strides in those areas and have earned recognition for their green-IT accomplishments. They continue on that path, showing that being green in the environmental sense is smart in the financial sense, too.

GREEN TEAMWORK IT Director Paul Baltzell has been pleasantly surprised by the way people in other parts of the Indiana state government have reacted to the IT department's green initiatives. "I thought we'd have more pushback," he says, "but people have been really supportive of it. We all have kids, so we want to do the best we can to take care of this place."

"They go hand in hand. If it's saving resources of some sort, then there is a value proposition from a financial standpoint, too," Arrowood says, noting that he uses the financial benefits of green IT to get approval for such tech projects.

Doug Washburn, an analyst at Forrester Research Inc., says most organizations, particularly in this economy, sell green-IT projects on their financial merits.

"Our data shows that when asked what is the primary motivator for green IT, hands down the No. 1 motivator is to reduce energy-related operating expenses," he says, adding that organizations put cutting overall operating expenses and capital expenses next on the list of motivators.

It's not surprising, then, that the

Indiana Office of Technology can continue with green initiatives even during this recession by smartly packaging projects as money-saving programs, Washburn says.

IT Director Paul Baltzell says the green initiatives undertaken in the past five years by the IT team — which supports more than 80 executive branch agencies, nearly 27,000 PCs and one data center — have yielded significant savings.

Case in point: The decision to standardize PCs throughout those agencies made it possible to offer centralized and remote support, and to deploy centralized power management. By identifying and resolving hardware problems remotely, technicians can eliminate an estimated 80% of desk-side visits, which is projected to reduce carbon emissions by 856,286 pounds over four years and save nearly $200,000 in the first year of full activation.

Efforts to consolidate and virtualize the 2,500 servers in the data center are yielding more gains, Baltzell says. There are now 708 virtual servers, accounting for 30% of the data center; efforts to increase that figure are ongoing.

Baltzell says the IT department wants to invest in other technologies that will produce both financial and environmental savings. For example, IT is looking at print management software that would automatically set print jobs to perform at the lowest cost per page as well as track printing use by department and employee. (Baltzell says such tracking allows managers to spot potential excess printing.)

Meanwhile, Arrowood says his staff is working on projects designed to save money and increase service yet also produce green benefits. Those projects include making more state services available online, which reduces paper consumption and travel requirements.

"Green just happens to be a natural byproduct of overall efficiencies," he says.

The projects undertaken by the department during the past two years have improved the productivity of the IT staff and generated annual savings of about $13.9 million, a figure that includes savings from reduced energy consumption. ◆

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» Allstate's LEED Gold-certified data center in Rochelle, Ill.

6 Allstate Insurance Co.

From virtual servers to teleconferences, this insurer finds ways to save in every corner.

[redacted]

WHEN IT COMES to green initiatives, 2009 was a banner year for Allstate Insurance, with the opening of a $55 million LEED Gold-certified data center and plans to consolidate four data center facilities into two.

It's a hard act to follow, but since then, according to Anthony Abbattista, vice president of technology solutions, the company has become even more dedicated to environmental responsibility. Now it's a matter of taking what it learned from the new facility and applying it to the rest of the company. "We're seeing the business case come alive," Abbattista says.

When decommissioning is complete, Allstate will have closed three of its four

GREEN TEAMWORK

Allstate's approach to green IT was to start out by proving a concept and then scaling it into other areas. But Anthony Abbattista, vice president of technology solutions, says employees quickly caught on. "Once we had some small successes, we marketed them a little bit and were pleasantly surprised at the pickup," he says. For instance, the initial plan for the new data center was to work toward a LEED Bronze certification, he says. But when IT realized how good the business case was, it began working with the property group to strive for — and achieve — the more stringent Gold certification.

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"Earth Rangers is interesting because it demonstrates starkly that 'big green advances' are not the sole remit of big organizations," says Mark Peters, a senior analyst at Enterprise Strategy Group Inc. "In 100 square feet, and with only 10% of a traditional hardware approach, its achievements and technologies are up there with the most advanced of the megacorporations."

Earth Rangers spent months researching the most power-efficient equipment from the most environmentally conscious companies, according to Rob Di Stefano, IT systems director. The implementation included a RAM-intensive blade server system from Dell that reduced the organization's previous eight physical servers to three physical M600 blade servers running 64 virtual servers.

In the future, Earth Rangers expects to benefit from a 40-well geothermal plant it is building to heat and cool the facility, as well as another solar array.

To reach its goal of cutting energy use 20% annually, it has invested in technology that tracks energy usage throughout the facility. "We can't meet our goal without that fine control," says Kendall. ◆

» Indiana Office of Technology employees have shown that green IT yields financial benefits.

5 State of Indiana

Remote support slashes desk-side visits at 80 state agencies, reaping six-figure savings.

GREEN TEAMWORK

IT Director Paul Baltzell has been pleasantly surprised by the way people in other parts of the Indiana state government have reacted to the IT department's green initiatives. "I thought we'd have more pushback," he says, "but people have been really supportive of it. We all have kids, so we want to do the best we can to take care of this place."

[redacted]

WHEN MITCH DANIELS took office as governor of Indiana in 2005, he created the Office of Technology and charged it with creating more-efficient IT operations. That mandate meant improving IT services as well as creating a more environmentally friendly technology platform, says state CIO Brian Arrowood.

State IT leaders have made important strides in those areas and have earned recognition for their green-IT accomplishments. They continue on that path, showing that being green in the environmental sense is smart in the financial sense, too.

"They go hand in hand. If it's saving resources of some sort, then there is a value proposition from a financial standpoint, too," Arrowood says, noting that he uses the financial benefits of green IT to get approval for such tech projects.

Doug Washburn, an analyst at Forrester Research Inc., says most organizations, particularly in this economy, sell green-IT projects on their financial merits.

"Our data shows that when asked what is the primary motivator for green IT, hands down the No. 1 motivator is to reduce energy-related operating expenses," he says, adding that organizations put cutting overall operating expenses and capital expenses next on the list of motivators.

It's not surprising, then, that the

Indiana Office of Technology can continue with green initiatives even during this recession by smartly packaging projects as money-saving programs, Washburn says.

IT Director Paul Baltzell says the green initiatives undertaken in the past five years by the IT team — which supports more than 80 executive branch agencies, nearly 27,000 PCs and one data center — have yielded significant savings.

Case in point: The decision to standardize PCs throughout those agencies made it possible to offer centralized and remote support, and to deploy centralized power management. By identifying and resolving hardware problems remotely, technicians can eliminate an estimated 80% of desk-side visits, which is projected to reduce carbon emissions by 856,286 pounds over four years and save nearly $200,000 in the first year of full activation.

Efforts to consolidate and virtualize the 2,500 servers in the data center are yielding more gains, Baltzell says. There are now 708 virtual servers, accounting for 30% of the data center; efforts to increase that figure are ongoing.

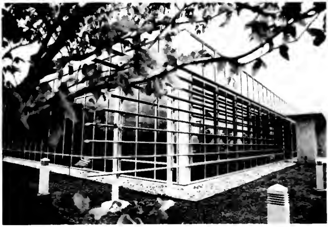
Baltzell says the IT department wants to invest in other technologies that will produce both financial and environmental savings. For example, IT is looking at print management software that would automatically set print jobs to perform at the lowest cost per page as well as track printing use by department and employee. (Baltzell says such tracking allows managers to spot potential excess printing.)

Meanwhile, Arrowood says his staff is working on projects designed to save money and increase service yet also produce green benefits. Those projects include making more state services available online, which reduces paper consumption and travel requirements.

"Green just happens to be a natural byproduct of overall efficiencies," he says.

The projects undertaken by the department during the past two years have improved the productivity of the IT staff and generated annual savings of about $13.9 million, a figure that includes savings from reduced energy consumption. ◆

Pratt *is a* Computerworld *contributing writer in Waltham, Mass. Contact her at marykpratt@verizon.net.*



» **Allstate's LEED Gold-certified data center in Rochelle, Ill.**

6 Allstate Insurance Co.

From virtual servers to teleconferences, this insurer finds ways to save in every corner.

[redacted]

GREEN TEAMWORK

Allstate's approach to green IT was to start out by proving a concept and then scaling it into other areas. But Anthony Abbattista, vice president of technology solutions, says employees quickly caught on. "Once we had some small successes, we marketed them a little bit and were pleasantly surprised at the pickup," he says. For instance, the initial plan for the new data center was to work toward a LEED Bronze certification, he says. But when IT realized how good the business case was, it began working with the property group to strive for – and achieve – the more stringent Gold certification.

WHEN IT COMES to green initiatives, 2009 was a banner year for Allstate Insurance, with the opening of a $55 million LEED Gold-certified data center and plans to consolidate four data center facilities into two.

It's a hard act to follow, but since then, according to Anthony Abbattista, vice president of technology solutions, the company has become even more dedicated to environmental responsibility. Now it's a matter of taking what it learned from the new facility and applying it to the rest of the company. "We're seeing the business case come alive," Abbattista says.

When decommissioning is complete, Allstate will have closed three of its four data centers. "I'd expect we'll have halved our power costs to run the data centers in our company by the end of this year," Abbattista says. It has also eliminated 1,500 physical servers, thanks to server virtualization, and it plans to continue shifting its ratio of virtual to physical servers in the coming years, further reducing energy demands, Abbattista says.

The staff is similarly dedicated to taking its new knowledge in raised-floor design and energy efficiency and not only continuing to tweak it in the new facility, but also applying it to the existing one, says Brandi Landreth, director of data center strategy. "They're really paying attention to the individual servers, like looking at the hot rows and cold rows to see whether they're hot or cold enough. People are interested now who weren't before."

It's this follow-up work that's so important, Landreth says. "We could build a really energy-efficient building and meet LEED standards for construction, but if we don't put the operational practices behind that, we won't achieve the benefits," she says. "That's where, over the long term, we'll start to see the payoff."

Next, Abbattista's group is focusing on on-demand software models and thread-rich designs that take advantage of variable and shared capacity. "We're looking beyond the physical ways to save energy, to how do we make better software decisions," he says.

IT has also renewed its commitment to collaboration tools, to reduce the need for employee travel. Already, with the help of VoIP technology, virtual desktops and videoconferencing, more employees are working from home, either full or part time. The number of full-time home-based workers in IT has risen by 10% in the past two years, Landreth says.

Best practices for sustainability are shared via the corporate intranet, and the company holds contests for the most innovative green solutions.

"Allstate has clearly driven data center design to a high efficiency level; however, I am also struck by its interest in opening up the corporate suggestion box, with rewards for good ideas," says Mark Peters, a senior analyst at Enterprise Strategy Group Inc. "No one should ever assume that the best green ideas can only come from 'on high' or from the 'green teams.'" ◆

7 George Washington University

Servers are virtualized, and desktops are next, at this D.C.-area university.

GEORGE WASHINGTON University was witnessing a familiar trend: rising power use — and corresponding increases in energy costs.

"The bills were going up and up and up, and at the same time there was a lot of talk in higher ed about energy consumption," says CIO David Steinour.

The IT department took action, a move that dovetailed with university President Steven Knapp's decision to make sustainability one of the Washington, D.C.-based school's four strategic initiatives.

Information systems engineer Brian Mislavsky says the IT department has been working on server consolidation and virtualization for the past five years, a project that has yielded big savings by reducing the use of energy, equipment and space. The university now has about 65% of its servers virtualized, saving more than 800,000 kilowatt-hours annually. It's working toward reaching the 80% mark by 2012, Mislavsky adds.

Moreover, its new data center, which opened in January, was designed, built and equipped with environmentally friendly systems and energy-efficient products.

» GW's IT team includes (from left) senior IS engineer David Druther, IS coordinator Naveed Yousaf and IS engineer Brian Mislavsky.

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GW CIO David Steinour acknowledges that there are challenges to implementing his green-IT agenda, mostly coming from people who resist changes in the way they work. But he says that won't slow down his department. "I think the biggest surprise we've had is in terms of the recognition and the support from the community," he says. "We've won a few awards, I've done some speaking, and we've put the challenge out to other universities to do something."

Doug Washburn, an analyst at Forrester Research Inc., says these strategies put George Washington University among the leading organizations that have developed a strategic vision for being greener.

"Right now, 50% of organizations around the world have a green-IT plan in place and are actively implementing the strategies. And if an organization does have broader initiatives under way, that's where IT is asked to contribute," he says, noting that reducing energy consumption through server consolidation and virtualization is often the first step.

The university's IT department is working on green initiatives that move beyond cutting energy consumption. It is pushing the use of document imaging, which cuts back on the use of paper and toner as well as the energy used to print, copy and store paper files, Steinour says. The department is also careful about how it disposes of old technology, donating some equipment to charity to ensure that each piece is used for its full life cycle, and then recycling the rest. ◆

» PG&E has partnered with SunPower to build a 250-megawatt solar ranch, which will deliver an average of 550,000 megawatt-hours of clean electricity annually.

PACIFIC GAS & ELECTRIC

8 Pacific Gas & Electric

At this utility, printers, and even servers, are **resource-conserving** by default.

[redacted]

WHEN IT COMES to green IT, Pacific Gas & Electric knows how to talk the talk. The California utility already promotes energy conservation to its customers through a variety of incentives targeting everyone from consumers to data center operators.

It also launches internal initiatives, such as its recent "Think before you print" campaign. But the utility practices what it preaches by making green-IT best practices its gold standard. Users don't opt in — they have to opt out.

For example, all printers are set to two-sided, black-and-white printing by default. Want to print color or one-sided? You'll need to change the print settings for the job. That policy alone cut printing by 51 million pages last year, saving $460,000 in paper and consumables costs, says Scott McDonald, IT architect.

Want a server? It's virtualized by default unless you can justify an alternative. "To opt out, people have to go through a level of transparency with their leadership," says McDonald. "We are virtualizing 80% to 85% of new loads." IT has virtualized almost half of the 1,900 servers in the company. That cut energy use by 2,600 megawatt-hours last year — a $370,000 savings.

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IT is also finishing up a power management system that will automatically force employees' 22,270 PCs into sleep mode after an hour of inactivity and turn off monitors after 20 minutes. PG&E projects annual savings of about 5,060 MWh, or $725,000. ◆

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It's easy to innovate when you're surrounded by a culture that encourages it, Crossley adds. For example, every floor of his building has a compost bin as well as cans for recycling traditional items such as paper and bottles. "These aren't technology innovations, but it breeds the culture," he says. "A lot of our traction has been at the grass-roots level."

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Its computing capacity soars, yet this railway draws down power use.

[redacted]

ENVIRONMENTAL stewardship is deeply ingrained in the corporate culture at Union Pacific Railroad Co., and implementing green-IT systems plays a central role in the railroad's efforts to conserve energy.

Since 2000, the Omaha-based company has spent about $6 billion on new, environmentally friendly locomotives. It has also retired more than 2,300 older, less fuel-efficient trains and overhauled almost 3,200 diesel engines to run cleaner and more efficiently. Recycling is encouraged at all locations, and energy efficiency was a critical consideration when the company built a new 19-story corporate headquarters facility.

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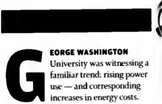

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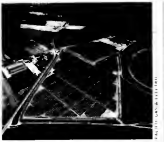

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Pacific's data center that has been a focal point of its most recent green efforts. The data center has allowed the railway to accommodate significant growth in servers and disk capacity. Since 2008, the company has increased its computing capacity by about 200% and its disk storage capacity by about 700%.

During the same period, however, power consumption in the center actually decreased by about 14%. "We made a concerted effort to reduce energy consumption," says Lynden Tennison, senior vice president and CIO. "We've done that by modernization of the equipment." For example, Union Pacific uses blade servers rather than older, large towers.

"Servers are typically responsible for around 40% of a data center's total electricity bill," says Doug Washburn, an analyst at Forrester Research Inc. "While sourcing more efficient servers, like blades, is one solution, IT managers need to focus on improving the utilization of their existing servers through decommissioning, consolidating and virtualizing."

The company has also deployed energy-efficient HVAC and building-automation controls, power management software and server virtualization systems, and it has revised its data center layout to reduce power demands. In addition, the railroad uses alternative energy supplies such as solar and wind to provide power to IT systems. ◆

Violino *is a freelance writer in Massapequa Park, N.Y. Reach him at bviolino@optonline.net.*

BRIAN K. FALCON / BAKER HUGHES

» The Baker Hughes IT team in front of one of its new green facilities (from left to right): Donnie Forehand, Tom Gardosik, Graham Crisp, Karen Lane, Eva Royer and Ivan Skerl.

10 Baker Hughes Inc.

This energy company's **high-performance computing program** keeps servers humming in nonpeak hours.

THE IT ORGANIZATION at Baker Hughes Inc. integrates green practices into all aspects of its operations, from developing new technologies to retiring old systems. The approach enables the Houston-based provider of oil and gas services to decrease energy consumption from IT equipment, says Karen Lane, global health safety and environmental and security process leader, who coordinates the company's green-IT efforts.

GREEN TEAMWORK
Through its partnership with the Enterprise Sustainability and Environmental Affairs group, "IT has gained more knowledge earlier in the planning and development of green-IT initiatives," says Graham Crisp, Baker Hughes' IT assets director. "[That allows] us to make better decisions and be more proactive in our sourcing strategy to implement more value-added programs."

Initiatives that have contributed to improvements in energy efficiency include server virtualization, the implementation of PC power-saving software and the installation of energy-efficient servers and PCs and Energy Star-rated desktop monitors. Baker Hughes began these initiatives in 2008, reducing its CO_2 emissions by an estimated 7,500 metric tons and saving $1.1 million in energy costs in the first year, according to Donnie Forehand, director of client computing services.

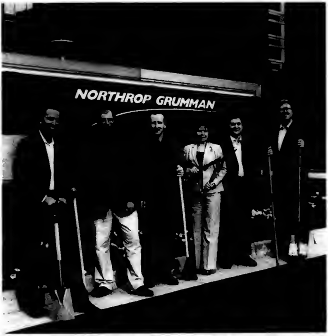
Another key project, Green High-Performance Computing, takes advantage of existing infrastructure and underused servers to perform large-scale computing jobs during off-peak nighttime hours. The technology wakes up and shuts down the computers to create "green supercomputing." The program makes it possible to deliver data analysis 35% faster and cuts energy use by up to 40%.

Yet another initiative, a managed print-services program launched this year, improves the efficiency of printing processes overall by curbing consumption of paper, power and printer materials. As part of the program, printers are consolidated and replaced with more energy-efficient models. The program is estimated to cut energy use by 20% to 25%, which translates into savings of $2.8 million each year.

The Baker Hughes IT team has partnered with the company's internal environmental unit, the Enterprise Sustainability and Environmental Affairs group, to advance green IT. "Through this partnership," Lane says, "IT has reduced our [systems'] energy consumption and established sound environmental practices for retiring and recycling used IT assets over the last several years."

By working with the environmental affairs team, IT has become more familiar with global programs such as the European Union's Waste Electrical and Electronic Equipment Directive, which holds manufacturers in Europe responsible for the disposal of electrical and electronic equipment.

Simon Mingay, an analyst at Gartner Inc., thinks having IT work with other units on green efforts is important. "I very much like the partnership with and contribution from the wider environmental and sustainability team," he says. "They can bring a perspective and expertise to the program that the IT organization often lacks." ◆



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» Northrop Grumman's green-IT team has the tools to reduce the company's carbon footprint by embracing environmentally friendly IT practices. From left: Frank Ioli, Steve Reger, Fred Hurd, Constance Curran, Dave Gidaro and CIO Bernie McVey.

11 Northrop Grumman Corp.

This aerospace powerhouse **finds huge energy savings** in IT equipment both big and small.

[redacted]

AT NORTHROP GRUMMAN CORP., environmental sustainability is part of the company's long-range strategic plans.

The Los Angeles-based

GREEN TEAMWORK

The biggest eye-opener for Brad Furukawa, vice president and CTO, was the widespread acceptance of green-IT initiatives throughout Northrop Grumman. "I'm finding our employees are extremely conscious of the benefits of green and are supportive of initiatives that reduce [greenhouse gas] emissions," he says.

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11 Northrop Grumman Corp.

This aerospace powerhouse **finds huge energy savings** in IT equipment both big and small.

AT NORTHROP GRUMMAN CORP., environmental sustainability is part of the company's long-range strategic plans.

The Los Angeles-based

GREEN TEAMWORK

The biggest eye-opener for Brad Furukawa, vice president and CTO, was the widespread acceptance of green-IT initiatives throughout Northrop Grumman. "I'm finding our employees are extremely conscious of the benefits of green and are supportive of initiatives that reduce [greenhouse gas] emissions," he says.

aerospace and electronics manufacturer's IT department is leading several green initiatives, including one called the Desktop Solutions Program, which launched in January.

As part of that effort, says Brad Furukawa, vice president and chief technology officer for strategy, architecture and integration, the IT group is using the Green Electronics Council's Electronic Product Environmental Assessment Tool (EPEAT) as a guide when deploying PCs, laptops and peripherals. EPEAT gives products gold, silver or bronze ratings based on their environmental attributes. Northrop Grumman now buys only gold- and silver-rated products. An IT refresh program that adheres to those purchasing guidelines is expected to yield power savings of 10%. The Desktop Solutions Program also addresses environmentally friendly disposal of replaced devices.

The energy consumption of distributed IT equipment adds up, says Doug Washburn, an analyst at Forrester Research Inc. "On average, IT actually uses more energy outside of the data center than within it," he says. "We find that of IT's total energy footprint, 55% is consumed by distributed IT assets."

Northrop Grumman has also undertaken an effort to reduce the energy usage of desktop PCs, monitors and laptops. The company plans to use power management tools that will move devices to "significantly lower power states during nonuse hours, while waking them for after-hours maintenance activities," Furukawa says. IT completed a pilot in June and expects to deploy this capability enterprisewide by year's end. It's expected to yield power savings of 21%.

In another IT-led initiative, the company is consolidating more than 100 major data centers and server rooms into three data centers. This will eliminate more than 26 million pounds of CO_2 emissions annually — the equivalent of planting 60,000 trees or removing 4,500 cars from the highways. Northrop Grumman began this effort in January and expects to complete it by 2013.

On top of all that, Northrop Grumman this year began virtualizing about 3,000 servers, reducing its server environment by 80% and cutting power consumption by an estimated 46%. ◆

12 Marriott International Inc.

The global hotelier **saves thousands of gallons of water** with closed-loop chillers in the data center.

[illegible]

[redacted]

MARRIOTT International Inc. isn't counting on big new advances in green IT. Instead, the Bethesda, Md.-based hospitality giant is counting on incremental changes to make its IT operations more eco-friendly.

» Green IT is "more like a marathon than a sprint," says Marriott VP Daniel Blanchard.

"This green initiative is more like a marathon than a sprint," says Daniel Blanchard, vice president of enterprise IT operations. "And the farther along we go, the deeper we have to dig to find those opportunities."

Since it opened a new data center 220 feet underground in 2009, Marriott has made an effort to continually ramp up its environmentally friendly IT operations, Blanchard says.

In the past year, the company upped the temperature in its data center five to seven degrees and switched a significant portion of its chillers to a closed-loop-based system, cutting power consumption by about 10% and saving nearly 800,000 gallons of water annually. "We went from using a lot of water to using virtually no water," Blanchard says.

And since it's always on the lookout for ways to save on energy, Marriott last year bought 13,699 Energy Star-compliant PCs, monitors and printers, says Blanchard.

Meanwhile, he says, the company is planning to install sophisticated software to manage its server environment, powering down machines when they're not needed, much like power management software does for PCs.

Brian Babineau, an analyst at Enterprise Strategy Group Inc., says that as leading green companies like Marriott move ahead, their challenge is to continue to find IT infrastructure improvements and identify areas where technology can change business processes to yield environmental benefits. "What you see is more of this concept of sustainability, where they put more recurrent efforts in place to do the right thing as an organization," he says.

Blanchard says the IT department is able to maintain its environmental focus partly because Marriott's executives have made it a priority. They created the Green Council and gave IT leaders the authority to implement green strategies. The company also relies on staffers to suggest ideas for green innovations.

"What we're expected to do and what we do is integrate impact on the environment into everything," Blanchard says. ◆

GREEN TEAMWORK

The [illegible] Marriott's green-IT initiatives has been [illegible]

[illegible]

How we determined the Top Green-IT Organizations

FOR THE THIRD YEAR IN A ROW, *Computerworld* set out to identify organizations that are implementing smart, efficient strategies to achieve "green IT." This year, *Computerworld* teamed up with sister publication *Network World* to identify the top organizations leading the way with green-IT efforts, as well as the coolest green-IT products in use and on the horizon. Organizations were invited to complete a comprehensive questionnaire online from May to July. Invitations were sent to the IT community through a variety of channels, including e-mail newsletters, *Computerworld.com* and e-mail broadcasts. Ninety-five organizations participated. *Computerworld* then contacted representatives at the participating organizations to verify that the information provided on the survey was truthful and accurate. Only those organizations that filed verification letters were considered. *Computerworld* then applied a set of criteria, developed with the help of green-IT industry experts, to identify the organizations that are working to reduce energy consumption in IT equipment and using technology to conserve energy and lower carbon emissions. A separate list was created to showcase IT vendors and data center suppliers. It included hardware, software, networking, IT infrastructure and data center vendors.

Based on the weighting criteria that had been developed, the lists of the top 12 Green-IT Users and the top 12 Green-IT Vendors were chosen. Respondents were also asked to identify the most effective green-IT products they are using now – and to note any cost savings and/or environmental impact – as well as the types of green-IT products they are researching or piloting. Then *Network World* explored the most frequently cited products on that list. That story package can also be found at *Computerworld.com*. ◆

MORE ONLINE
For the full list of survey questions and scoring, visit computerworld.com/[illegible]

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GREEN TEAMWORK

The most unexpected aspect of Marriott's green-IT initiatives has been the lack of resistance from other departments, says Daniel Blanchard, vice president of enterprise IT operations. "That goes back to green being a big part of our corporate culture," he says. "Around here we say, 'We are all guests on this planet.'"

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MORE ONLINE
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OPINION

JONATHAN KOOMEY

Technology's Role as Energy Game-Changer

MOST FOLKS THINK that computers use a lot more energy than they actually do and that usage levels are growing at incredible rates. Neither belief is accurate, and those incorrect assumptions mask an important truth: IT has beneficial environmental effects that vastly outweigh the direct environmental impact of the electricity consumed.

Consider the example of downloading music versus buying a CD. A study published in the peer-reviewed *Journal of Industrial Ecology* showed that, compared with buying physical CDs, downloading music reduced emissions of greenhouse gases 40% to 80% when all elements of both processes are factored in, including the manufacturing, packaging and shipping of CDs, and the use of electricity for computers and networking.

Other studies have found similar results. In general, moving bits is environmentally preferable to moving atoms, and whether it's dematerialization (replacing materials with information) or reduced transportation (from not having to move materials or people, because of electronic data transfers or telepresence), IT is a game-changer.

Technology can help us become smarter and more capable so we can use our resources more efficiently. This could take the form of better sensors and controls in offices and industrial buildings, like the wireless sensor networks that can be quickly and cheaply distributed in existing structures. Or it could occur through more widespread use of software to make better energy-related decisions, such as Lawrence Berkeley National Laboratory's Home Energy Saver tool or the private-sector tool called Wattbot, both of which I've worked on over the years.

Technology can drive change by taking advantage of innovations such as computer controls in automobile engines, which reduce pollutant emissions and improve fuel economy; smart meters that track electricity use minute by minute; or analysis software that gives companies visibility into their actual energy costs by scanning utility bills (as systems from Advantage IQ do, for example).

All of these examples and more are enabled by cheap, abundant and powerful information technology.

The strength of IT should also give us hope about meeting the aggressive international goal of limiting the rate of global warming to no more than 2 degrees Celsius over levels seen in pre-industrial times. Never before has society had to confront a challenge like this, but never before have we had such powerful technology to help us. And if we combine ubiquitous mobile computing with rapid advances in solar photovoltaic technologies (like the systems used in products such as solar-powered trash-compacting garbage cans), the possibilities for truly game-changing societal innovation are breathtaking.

Of course, this story is as much about personal and institutional change as it is about technology, and without a focus on the human and organizational evolution (as well as a stiff price on carbon), we'll continue on our current unsustainable path.

But an important tool for dealing with the climate challenge is already available: Information technology is allowing us to dematerialize, reduce transportation emissions and get smarter faster. There's no time to waste in putting it to work. ◆

> IT has beneficial environmental effects that vastly outweigh the direct environmental impact of the electricity that it consumes.

Jonathan Koomey is a leading expert on the effects of IT on resource use. You can contact him at *www.koomey.com.*

Career Watch

Smile, You're at A Job Interview

YOU PROBABLY know that you should make eye contact during a job interview. But a recent survey manages to quantify how many hiring managers would be inclined not to offer a job to someone who failed to make eye contact or displayed other instances of poor body language. Here's how various faux pas stack up.

Failure to make eye contact	67%
Lack of smile	38%
Fidgeting too much	33%
Bad posture	33%
Handshake that is too weak	26%
Crossing arms over chest	21%
Playing with one's hair or touching one's face	21%
Using too many hand gestures	9%

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[30,200]

Net number of tech jobs added in the first half of 2010. In the same period of 2009, 143,000 net jobs were lost.

SOURCE: TECHAMERICA FOUNDATION

ASK A PREMIER 100 IT LEADER

Jim Fortner

The **Procter & Gamble** *vice president answers questions about training on the cheap and giving input to a nontechnical boss.*

The company I work for used to be very generous about training, but it has cut back severely. I can't do it on my own, but I don't want to be left behind in skills. What can I do? It is critical that you continue to invest in yourself. Do not let your company's lack of funds be a barrier to advancing your career.

There are four types of training that do not cost much. First, many of the offerings on the Web present opportunities for real skills-building. The second option is distance learning, which is also generally accomplished through the computer. Third, local communities of shared interest can provide relevant training in technology, project management and even leadership. Finally, you can learn on the job by joining up with others outside your team so you can develop broader points of view. I have learned a lot over the years taking on different assignments and meeting with all kinds of people outside of my space.

If you have a question for one of our Premier 100 IT Leaders, send it to **askaleader@computerworld.com**, and watch for this column each month.

Certifications are also important. They are visible signs that you are a learning employee, which every employer wants. For example, a certification in project management is a great asset.

The IT industry is alive and well in the U.S. The Digital Age is in the early stages, and having employees who have strong enterprise skills and who like to learn is invaluable.

I'm pretty much a tech guy. I wouldn't expect to be anyone's choice for a management role — too head-down, results-oriented. Still, I sometimes have what I consider to be good ideas for the larger organization. My manager (who is far less of a tech guy) hasn't shown much interest in my input. I find that pretty irritating. What can I do about this? Let me commend your deep technical skills. Companies need IT leaders who are both technically and organizationally savvy.

Labeling yourself as technical tells others that you are not someone to involve in managerial and business issues. Begin professing that your passion is to improve business results. Next, build a relationship with your manager. As you get to know each other, you will appreciate each other's diverse sets of skills, and he may open up and listen to your ideas. Finally, present him with ideas that are carefully thought through and that clearly show how he can drive further business value. Managers are not stupid; they want to look good, and they appreciate employees who make them look good.

If you ever pit yourself against your manager, you will lose. Since your manager is not much of a tech guy, you will need to talk less technology and more business benefits and business processes.

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SHARKTANK

TRUE TALES OF IT LIFE AS TOLD TO SHARKY

HAL MAYFORTH

You'll Fit Right in Here

The IT department where this pilot fish works has a tradition of employees bringing in food to celebrate their own notable events: birthdays, work anniversaries, things like that. Reports fish, "One of our new hires took this to heart recently with this e-mail, which quoted almost directly from the company's employee handbook: 'I have enjoyed employment here now for 90 days, meaning I am no longer under the new employee probationary period! While under probation, I could have been discharged without recourse. But now that I'm a regular employee, I may be discharged at any time, for any reason or for no reason, with or without notice. As you can imagine, this is a big day for me. Please help me celebrate this milestone by taking a treat from the break room.' "

Petty, That's What It Is

At this federally funded facility, IT pilot fish needs a $5 item for his job – which used to be no big deal. "Our group had a petty cash fund that handled the little things," says fish. "This worked well in our group, as everyone was honest, but apparently other groups had problems, so accounting withdrew all petty cash. So I bought the $5 item and the secretary filled out all the forms and submitted the expense report. Three months later, the check arrived with an angry note from the accounting manager: *Do you realize it cost $200 to process your report for $5?* I sent a note back indicating that accounting had removed petty cash and this was the only way to get the money. Perhaps petty cash should be restored so this expense won't happen again. His response: 'That won't happen, as we would have no paperwork to track your petty expenses.' "

Perfect 100

Part of this IT pilot fish's job is managing the allocation of work time for his entire department. "I was asked to ensure that everyone was 100% allocated to projects for the next three months, on a rolling basis," fish says. "My manager's manager was rated on this metric, and her bonus was affected by it. The nature of our jobs was that we worked on projects for weeks, not months, and were constantly taking on new work. If we were truly 100% allocated, we could not take on any new work. The time allocation system was not linked to the system where time was recorded and charged to projects, so I suspended rational thinking and created a dummy project. Each month I put everyone's 'unallocated' time there. I got public kudos for having my department fully allocated, and all I did was make up numbers to ensure they added up to 100."

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BPA WORLDWIDE Periodical postage paid at Framingham, Mass., and other mailing offices. Posted under Canadian International Publication agreement PM40063731. **CANADIAN POSTMASTER:** Please return undeliverable copy to PO Box 1632, Windsor, Ontario N9A 7C9. Computerworld (ISSN 0010-4841) is published twice monthly by Computerworld Inc., 492 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171.

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STATEMENT OF OWNERSHIP, MANAGEMENT and CIRCULATION
(Required by 39 U.S.C. 3685)

1. Title of Publication: Computerworld
2. Publication No.:0010-4841
3. Date of filing: September 27, 2010
4. Frequency of issue: Twice Monthly
5. Number of issues published annually: 24
6. Annual subscription price: $129.00
7. Location of known office of publication: 492 Old Connecticut Path, PO Box 9171, Framingham, MA 01701-9171 (Middlesex-Central County)
8. Location of the headquarters of general business offices of the publishers Computerworld, 492 Old Connecticut Path, PO Box 9171, Framingham, MA 01701-9171 (Middlesex-Central County)
9. Names and addresses of the publisher, editor and managing editor: Senior Vice President/Group Publisher, Bob Melk, 492 Old Connecticut Path, Framingham, MA 01701-9171 Editor-in-Chief, Scot Finnie, 492 Old Connecticut Path, Framingham, MA 01701-9171. Managing Editor, Michele DeFilippo, (Production), and Ken Mingis (News), 492 Old Connecticut Path, Framingham, MA 01701-9171
10. Owner: International Data Group, 1 Exeter Plaza, Boston, MA 02116-2851
11. Known bondholders, mortgages and other security holders owning or holding 1% or more of total amount of bonds, mortgages or other securities: International Data Group, 1 Exeter Plaza, Boston, MA 02116-2851. None
12. For completion by nonprofit organizations authorized to mail at special rates: Not applicable
13. Publication Name: Computerworld
14. Issue date for circulation data below: September 27, 2010
15. Extent and nature of circulation

	Average No. Copies Each Issue During Preceding 12 Months	Actual No. Copies of Single Issue Published Nearest to Filing Date
A. Total number of copies printed (net press run)	155,746	154,948
B. Legitimate paid and/or requested distribution (by mail and outside the mail)		
1. Outside county Paid/Requested mail subscriptions stated on PS Form 3541	153,656	152,148
2. In-county paid/requested mail subscriptions stated on PS Form 3541	0	0
3. Sales through dealers and carriers, street vendors, counter sales, and other non-USPS paid distribution	489	486
4. Requested copies distributed by other mail classes through the USPS	0	0
C. Total paid and/or requested circulation	154,145	152,634
D. Nonrequested distribution (by mail and outside the mail)		
1. Outside county nonrequested copies stated on form 3541	0	0
2. In-county nonrequested copies stated on form PS 3541	0	0
3. Nonrequested copies distributed through the USPS by other classes of mail	0	0
4. Nonrequested copies distributed outside the mail	1,180	1,894
E. Total nonrequested distribution (Sum of 15d (1), (2), and (3))	0	0
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G. Copies not distributed	1,180	1,894
H. Total (Sum of 15f and 15g)	155,325	154,528
I. Percent paid and/or requested circulation (15c/15f x 100)	100%	100%

I certify that the statements made by me above are correct and complete.

Diana Turco
Circulation Manager

OPINION

FRANK HAYES

A Debt That IT Need Not Pay

INTERNET EXPLORER may be losing favor among most users, but in big companies, it's still doing fine — especially IE6. Why? "We have to use IE6," a contractor at one telco told me recently. "We have all these Web applications that won't run on a browser that isn't broken." And that means big trouble — doesn't it?

Gartner thinks so. In a report last month, the big analyst firm estimated that outdated software like IE6 has created a "global IT debt" of $500 billion. That's how much it would cost to update old apps so they're shiny and new and fully supported. (Exactly who is that "debt" owed to? Software vendors, presumably.)

Of course, in this economy many companies can't afford to upgrade old software. Taking that into account, Gartner helpfully predicted that the total IT debt will rise to $1 trillion by 2015.

How much does IE6 contribute to that total? That's hard to say — but we know this much-decried, ugly, ancient, nonstandard, broken browser is still used by half the Fortune 500, the U.K. government and a large number of other corporate and government organizations.

Why? It's simple: They depend on Web-based software that won't run correctly with any other Web browser.

So why won't they upgrade? Why are they letting that big IT debt accumulate? Won't all that deferred maintenance eventually cause them serious problems?

No, probably not.

Look, how did those IE6-dependent users get into that position? They bought into the last big paradigm of software development: the Web browser as platform. Remember? All our apps would be built with a Web front end. Microsoft thought that was a fine idea and built a lot of nonstandard features to lock customers in. Vendors and corporate IT shops used those features to make their Web apps just like regular Windows apps — and users were locked in but good.

How will these users get out of that mess? When the time (and budget) is right, they'll jump on the *next* big software development paradigm. They'll buy or build fresh, junk the old stuff completely and go about their business.

IT debt? They'll walk away from it.

And why not? Those apps built on IE6 may be creaky, ugly and nonstandard, but they still work. And Microsoft may hate its nine-year-old miscalculation, but it has promised to keep supporting IE6 until 2014.

Besides, how much sense would it make to patch up those old clunkers or migrate them to newer browsers? None at all. Those old apps were designed for business needs from as much as a decade ago. Technical upgrades won't solve that. Building or buying new apps will — and doing that will cost the same, whether the apps they're replacing are up to date or ready to collapse.

The sensible thing is to keep running those IE6-dependent Web apps until they can be replaced with new apps that run from the cloud or on tablets or using whatever the hot new paradigm is.

In the meantime, like the bumper sticker says: Don't laugh, it's paid for.

That's not the kind of thinking that makes software vendors, analysts and connoisseurs of elegant engineering happy — especially if they're big on the idea of an "IT debt."

But it's likely to keep an awful lot of IT shops out of debt — in more ways than one. ◆

Gartner estimates that outdated software like IE6 has created a 'global IT debt' of $500 billion.

Frank Hayes has been covering the intersection of business and IT for three decades. Contact him at cw@frankhayes.com.

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